PROC. ENTOMOL. SOC. WASH.
81(3), 1979, pp. 465–474

BIOSYSTEMATIC STUDIES OF CEYLONESE WASPS, VI.[1] NOTES ON THE SCLEROGIBBIDAE WITH DESCRIPTIONS OF TWO NEW SPECIES (HYMENOPTERA: CHRYSIDOIDEA)

KARL V. KROMBEIN

Senior Entomologist, Department of Entomology, Smithsonian Institution, Washington, D.C. 20560.

Abstract.—*Sclerogibba embiidarum* (Kieffer), 1925, from Sri Lanka is redescribed, as well as two new species, *S.* **taprobanana** from Sri Lanka and *S.* **citipes** from Sri Lanka, South India, and Burma.

Members of the Sclerogibbidae are unique among Chrysidoidea (*olim* Bethyloidea) in having many more antennal segments than the normal 12 or 13 and in having nymphs of Embioptera as their hosts. Females (Figs. 1–3) cannot be confused with those of any other family of aculeate wasps. The many-segmented antennae and enormously expanded fore femora are unique. The winged males are also readily recognized, for they have many-segmented antennae and the fore femora are enlarged though not so greatly as in females.

The only sclerogibbid described from Ceylon is *Mystrocnemis embiidarum* Kieffer, 1925, which is currently placed in *Sclerogibba* Rigg. and Stef.-Perez. During my field work in Sri Lanka we collected both sexes of one new species and females of a second new species, as well as a female of *S. embiidarum*.

Richards (1939) placed five genera in the synonymy of *Sclerogibba*, and retained *Probethylus* Ashmead as the only other valid genus of Sclerogibbidae. Probably some of these genera will have to be resurrected when a generic reclassification is based on the numerous and as yet unstudied sclerogibbids collected or reared by E. S. Ross during his field work on Embioptera.

Two genera are represented among the Ceylonese species, but I am describing all in *Sclerogibba* because of the uncertain status of *Mystrocnemis* Kieffer. Two species known only from females, *S. embiidarum* and *S. tap-*

[1] The preceding number in this series is "A Monograph of the Ampulicidae (Hymenoptera: Sphecoidea)," Smithson. Contrib. Zool. 298, in press.

robanana, n. sp., may belong to typical *Sclerogibba*; both have tarsal claws with a tiny erect subbasal tooth, bidentate mandibles, and lack a pair of anterolateral pitlike parapsides on the scutum. *S. citipes*, n. sp., may belong to *Mystrocnemis* Kieffer, a genus placed in synonymy by Richards, but until the holotype of *M. erythrothorax* Kieffer can be relocated or topotypic material made available, certain ambiguities in his original description cannot be clarified. Both sexes of *S. citipes* have the tarsal claws cleft apically with the inner tooth smaller, females have tridentate mandibles and a pair of anterolateral pitlike parapsides, and males have a small discoidal cell, making a total of six closed cells in the forewing. The male of *S. crassifemorata* Rigg. and Stef.-Perez, the type-species of *Sclerogibba*, has simple tarsal claws and five closed cells in the forewing, the discoidal cell lacking.

The holotype of *S. embiidarum* was reared from a specimen of *Oligotoma greeniana* Enderlein from Colombo, a locality where the annual rainfall is 100–150 inches. We found a second specimen of *S. embiidarum* associated with a colony of *Aposthonia ceylonica* (Enderlein) beneath the loose bark of an ehala tree (*Cassia nodosa*) in Colombo. My two new species were collected in several localities in the Dry Zone where the annual rainfall ranges from 50 to 75 inches. The two males of *S. citipes* were collected in a Malaise trap, and the females of *S. taprobanana* and *S. citipes* were found crawling on the ground among leaf litter. Three species of Embioptera were collected in a yellow pan trap placed among leaf litter at Palatupana, where both female species were collected. The former were *Oligotoma humbertiana* (Saussure), *O. saundersii* (Westwood) and *Aposthonia ceylonica* (Enderlein); all of these are potential hosts of the two sclerogibbids. E. S. Ross informed me that most species of Embioptera are opportunistic in their habitat, breeding among leaf litter in areas of low rainfall and beneath loose bark on trees in areas of higher rainfall. It appears that the sclerogibbids may be equally adaptable, for we collected the Ceylonese specimens of *S. citipes* among leaf litter in the Dry Zone, and Ross found his Burmese specimens of the same species beneath loose bark.

Considering the cryptic habitats preferred by sclerogibbids, I believe that other species still remain to be collected in Sri Lanka, particularly in the Wet Zone areas of much higher rainfall.

Sclerogibba citipes Krombein, NEW SPECIES
Figs. 1–5

Sclerogibba embiidarum (Kieffer), Richards, 1939:219 (specimens from Mangalore, India misidentified).—? Richards, 1958:17 (specimens from Madras, India).

The female of this species is separated at once from those of the other two Ceylonese species by having all tarsal claws cleft with the inner tooth

smaller. *S. citipes* also differs in having tridentate rather than bidentate mandibles, a pair of anterolateral parapsidal pits on the scutum, a strong median groove on the propodeum, and in the different formula of the short, stout setae of the tibial apex and first three tarsal segments.

The sex association in *S. citipes* is made on the basis of both sexes having cleft tarsal claws. The dentition of the tarsal claws appears to be of generic significance as noted in the introductory remarks.

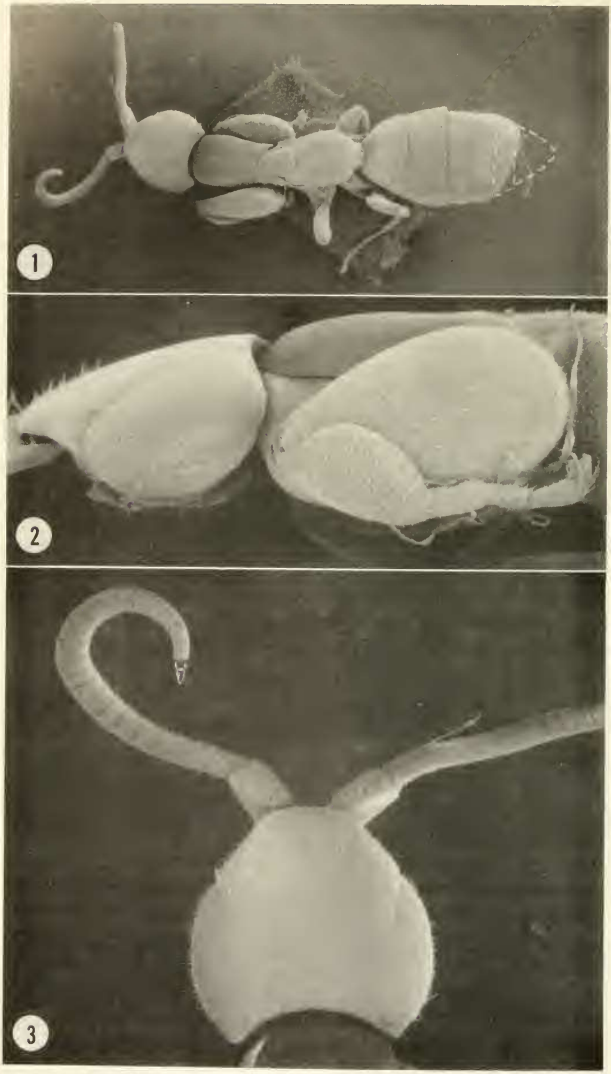
I have seen a male from Bangalore, India (BM) which has cleft teeth on the tarsal claws and six closed cells in the forewing as does the male of *S. citipes*. It is very similar to the type-series of *S. citipes* in body proportions and sculpture, but the marginal cell is only 0.9 times as long as the submarginal rather than 1.2 times as long.

In Sri Lanka *S. citipes* occurs in Dry Zone areas of low rainfall (50–75 inches annually) where I found females crawling on the ground among leaf litter. Both males were captured in a Malaise trap. Presumptive hosts in Sri Lanka may be the embiopterans *Oligotoma humbertiana* (Saussure), *O. saundersii* (Westwood) and *Aposthonia ceylonica* (Enderlein), all of which were captured in yellow pan traps set in the same leaf litter where females of *S. citipes* occurred at Palatupana. Ross found three females of *S. citipes* in a culture of *O. saundersii* beneath bark in Rangoon, Burma.

Eventually *S. citipes* may be placed in *Mystrocnemis* Kieffer. The type-species, *M. erythrothorax* Kieffer, was described from Rangoon, Burma, but the type cannot be located in the Genoa Museum which houses the Magretti collection. Kieffer's species has a cleft tarsal claw as does *S. citipes*. However, he says that the antenna is 22-segmented and that ocelli are lacking. The latter character may be a misinterpretation, but two species are known which have only posterior ocelli, so Kieffer may have been correct in his statement. It is not possible to decide whether *S. citipes* and *M. erythrothorax* are congeneric, until the type of the latter can be located or topotypic material obtained. The two species are clearly not conspecific for Kieffer states that the head of *M. erythrothorax* is much longer than wide, that the eye is as long as the cheek, and that the sides of the propodeum converge posteriorly.

The specific name is formed from the Latin citatus, and means swift-footed.

Female.—Length 3.2–4.0 mm. Black; the following dull red—palpi, mandible, anterior 1/7 of head above, scape, flagellum beneath, dorsum of thorax except pronotum and propodeum in middle becoming brownish to a variable extent, side of pronotum, fore tibia and all tarsi; the following dark brown to a variable extent—sides of mesopleuron and propodeum, rest of legs. Appressed vestiture on all of body cinereous to brownish, dense, very short, and fine; dorsum of head also with longer, dark, more scattered, suberect setae; eye with short erect silvery microtrichiae.


1
2
3

Head finely shagreened, rather dull, in dorsal aspect (Fig. 3) with median length subequal to greatest width; mandible tridentate; antenna with 23–27 segments; front with small, shallow median pit anteriorly; eye 3.3–4.1 times as long as dorsal width; eyes noticeably longer than cheeks, converging posteriorly, lower interocular distance 1.4–1.5 times least interocular distance; postocellar line (POL) 1.3–1.6 times lateral ocellar line (LOL), and 2.2–2.6 times ocellocular line (OOL); eyes and posterior ocelli only slightly separated from occipital margin.

Dorsum of thorax (Fig. 1) sculptured similarly to head; pronotum shallowly concave along midline, sides converging posteriorly, anterior width 1.2–1.4 times posterior width and 0.7–0.8 times length along midline; scutum with a pair of anterolateral pits; propodeal dorsum usually with a well-developed groove along midline (weak in two Burmese specimens), sides diverging posteriorly, posterior width 1.3–1.5 times anterior width and 0.9 times length; inner surface of fore tibia with an oblique row of 7 short stout setae running from spur to apex; fore basitarsus with irregular anterior row of 13–14 short stout setae, 2nd and 3rd tarsal segments each with 3 such setae at apex of segments; tarsal claws cleft, the inner tooth smaller.

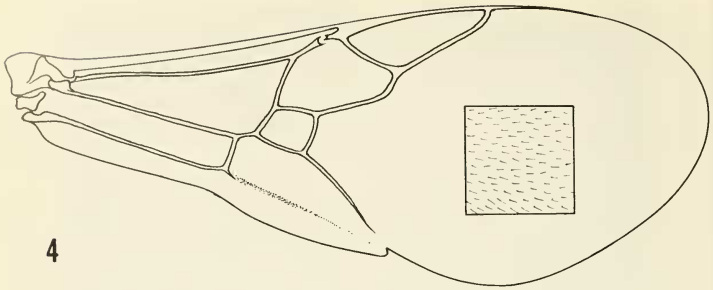
Male.—Length 3.0–3.5 mm. Black; the following light red—palpi, mandible, basal 6 segments of antenna and foreleg; the following light to dark brown—remainder of antenna, tegula, mid and hind legs but tarsi very light brown. Wings colorless, costal and subcostal veins medium brown, other veins colorless. Vestiture short, silvery, moderately dense, mostly decumbent except on dorsum of head where it is suberect; eye with very short, erect silvery microtrichiae.

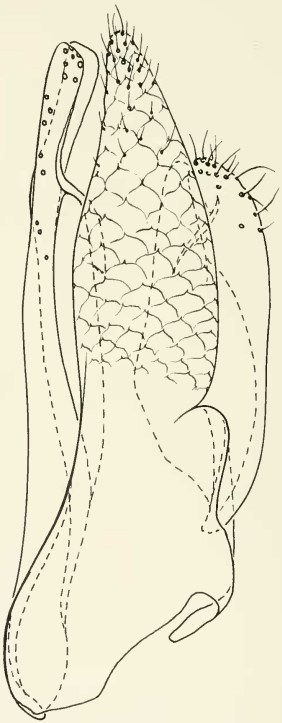
Head rather dull, finely shagreened; width 1.1 times the length; mandible bidentate; antenna 25–27 segmented; eye 4.6 times as long as dorsal width, converging posteriorly, the lower interocular distance 1.2 times interocular distance at posterior ocelli; ocelli in a low triangle, POL 1.7 times both LOL and OOL; posterior ocelli separated from occiput by diameter of an ocellus, posterior margin of eye separated from occiput by half that distance.

Thorax shinier and more delicately shagreened than head, especially mesopleuron; pronotum with sides diverging slightly, posterior margin broadly arcuate, posterior width 3.7 times median length; scutum with parapsides and notaulices complete, converging slightly posteriorly; propodeal dorsum rounding gradually into posterior aspect, surface with a strong median ridge and delicate rugulosoreticulations of small mesh; lateral aspect of propo-

←

Figs. 1–3. *Sclerogibba citipes*, ♀. 1, Dorsal view (terminal antennal segments lacking, 4th abdominal segment displaced and 5th and 6th lacking; scutal pits not visible), 23×. 2, Lateral view, head, prothorax and fore leg, 69×. 3, Dorsal view, head, 62×.





Figs. 4–5. *Sclerogibba citipes*, ♂. 4, Forewing. 5, Lateral aspect, genitalia.

deum shagreened and with a strong, oblique polished ridge across middle; tarsal claws cleft, the inner tooth shorter; forewing (Fig. 4) with 6 closed cells including 1 submarginal and 1 discoidal, marginal cell 1.2 times as wide as submarginal.

Abdomen shining with relatively scattered, tiny punctures, dorsum flattened; genitalia in lateral aspect (Fig. 5).

Types.—*Holotype*: ♀; Sri Lanka, Southern Province, Hambantota District, Palatupana Tank, 10–20 m, 27–29 September 1977, K. V. Krombein and P. B. Karunaratne, USNM Type No. 76075. *Allotype*: ♂, Sri Lanka, Eastern Province, Trincomalee District, Trincomalee, China Bay Ridge Bungalow, 0–100 ft, in Malaise trap, 16–17 May 1976, K. V. Krombein, P. B. and S. Karunaratne, D. W. Balasooriya. *Paratypes*: 4 ♀, same data as holotype. 1 ♀, Sri Lanka, Uva Province, Monaragala District, Angunakolapelessa, 100 m, 1 October 1977, K. V. Krombein. 1 ♂, same data as allotype. 2 ♀, India, Mysore State, Mangalore, J. C. Bridwell (USNM, BM). 3 ♀, Burma, Rangoon, 20 December 1978 (1 ♀) and 9 February 1979 (2 ♀), E. S. Ross, in culture of *Oligotoma saundersii* (Westwood) (CAS). A pair of paratypes has been deposited in the Colombo Museum; female paratypes are in (CAS) and (BM).

One female with the same label data as the holotype is excluded from the type-series because it is most likely a teratological specimen. It agrees with females of *S. citipes* in all details except that the posterior margin of the first abdominal tergum has a median angular emargination.

Sclerogibba embiidarum (Kieffer)

Mystrocnemis embiidarum Kieffer, 1925:236–237 (♀; Colombo, Ceylon; type stated to be in Deutsch. Ent. Inst., Dahlem).

Sclerogibba embiidarum (Kieffer), Richards, 1939:219 (♀ type only; ♀ specimens Mangalore, India misidentified).—Richards, 1958:17 (Israel ♀ misidentified; Madras ♀ correctly identified?).

Females of *S. embiidarum* and *S. taprobanana*, differ from those of *S. citipes*, in lacking a pair of anterolateral pits on the scutum, in having the tarsal claws with a small erect subbasal tooth, bidentate mandibles, and in having fewer short stout setae on the apex of inner surface of the fore tibia and first three fore tarsal segments. These two species may be assigned incorrectly to *Sclerogibba*. If the unknown males have the same dentition of the tarsal claws as the females, the two species probably belong to another genus. The male of *S. crassifemorata*, type-species of *Sclerogibba*, has simple tarsal claws.

Sclerogibba embiidarum differs from *S. taprobanana* in having a shallow median groove on the propodeal dorsum, in having LOL 1.9 times POL rather than 1.4, and in having POL 3.3 times OOL rather than 2.2. The

yellow color of the unique type is lighter than in any other sclerogibbid I have seen. Inasmuch as it is a reared specimen, the pale color may be due to its having been killed as a newly emerged teneral individual. A second female captured recently in Colombo is darker as detailed below.

The females from Mangalore, India (Richards, 1939:219) are actually specimens of *S. citipes*. A female from Israel (Richards, 1958:17) appears to be a new species related more closely to *S. taprobanana* than to *S. embiidarum*. I have not seen the female from Madras identified as *S. embiidarum* (Richards, 1958:17) which was reared from a nymph of *Pseudembia flava* Ross.

Holotype.—♀; Colombo, Ceylon, September 1924; K. Friedrich; parasite of *Oligotoma greeniana* End.; now deposited in Institut für Pflanzenschutzforschung, Eberswalde, D.D.R.

Female.—Length 3.5 mm. Black; the following pale yellow—mandible, clypeus, antenna, anterior ½ of front becoming somewhat reddened halfway to occiput, thorax and legs except for dark spot on mesopleuron, and narrow apices of first 3 abdominal terga; the following brownish—posterior ½ of head, narrow area anterior to yellow apices of first 3 terga, and apices of remaining terga. Vestiture closely appressed to body (due to preservation in fluid?), color not determinable; eye with short, erect, silvery microtrichiae.

Head shagreened, length and width subequal; mandible bidentate; antenna 24-segmented; front with small shallow pit anteriorly; eye 4.2 times as long as dorsal width; eyes longer than cheeks, converging posteriorly, lower interocular distance 1.5 times least interocular distance; POL 1.9 times LOL, and 3.3 times OOL; eyes and posterior ocelli only slightly separated from occipital margin.

Thorax sculptured similarly to head; pronotum slightly concave along midline, sides converging posteriorly, anterior width 1.2 times posterior width and 0.6 times length along midline; scutum without anterolateral pits; propodeal dorsum with a weaker groove along midline than in *S. citipes*, sides diverging posteriorly, posterior width 1.4 times anterior width and 0.9 times length; inner surface of fore tibia with an oblique row of 7 short stout setae running from spur to apex; fore basitarsus with anterior row of 12 short stout setae, 2nd and 3rd tarsal segments each with 2 such setae at apex; tarsal claws with a small erect subbasal tooth.

Male.—Unknown.

P. B. Karunaratne collected a second female of *S. embiidarum* in the Museum Garden, Colombo, 27 February 1979, beneath loose bark of an ehala tree (*Cassia nodosa*) in association with a colony of *Aposthonia ceylonica* (Enderlein). It appears to be smaller but the terminal abdominal segments are telescoped. It is much darker than the holotype, but the latter

may be a teneral. Otherwise it agrees in all details with the preceding diagnosis except as noted below:

Black; the following dull red—palpi, mandible, clypeus, antenna, anterior ⅓ of front, anterior edge and posterior ½ of pronotum, scutellum, upper ½ of mesopleuron; the following yellowish—posterior ⅔ of propodeum and coxae; the following light red—mid and hind tibiae and tarsi; all femora and fore tibia brown. Appressed vestiture cinereous to light brown, dense, very short and fine; dorsum of head also with longer, dark, more scattered suberect setae.

Head shinier; frontal pit evanescent; lower interocular distance 1.4 times least interocular distance; POL 1.7 times LOL and 2.7 times OOL.

Anterior pronotal width 1.4 times posterior width and 0.8 times length along midline; posterior propodeal width 1.3 times anterior width; inner surface of fore tibia with a row of 6 short stout setae.

Sclerogibba taprobanana Krombein, NEW SPECIES

This species is known from two females. It differs from *S. citipes,* and *S. embiidarum* as noted in the discussion under *S. embiidarum.* Both specimens were collected at Palatupana Tank in the Dry Zone of Sri Lanka, crawling on the ground among leaf litter.

The specific name is based on Taprobane, the Roman name for ancient Lanka.

Female.—Length 2.8–3.9 mm. Black; the following light red—palpi, mandible, clypeus, antenna, anterior ⅖ of head, thorax except dark areas of varying extent on mesopleuron and propodeum, legs and very narrowly on apices of first 5 abdominal segments. Appressed vestiture dense, short and silvery; dorsum of head also with longer, light brown suberect setae; eye with more scattered, short, erect silver microtrichiae.

Head finely shagreened, rather dull, length and width subequal; mandible bidentate; antenna with 24 and 27 segments; front with small shallow pit anteriorly; eye 3.3–3.5 times as long as dorsal width; eyes converging posteriorly, lower interocular distance 1.4–1.7 times least interocular distance; POL 1.4 times LOL and 2.6–2.8 times OOL; eyes and posterior ocelli only slightly separated from occiput.

Thorax duller and more strongly shagreened than head; pronotum shallowly concave along midline, sides converging posteriorly, anterior width 1.2–1.3 times posterior width and 0.7–0.8 length along midline; scutum without anterolateral pits; propodeal dorsum flat, without median groove, sides diverging posteriorly, posterior width 1.3 times anterior width and 0.6 times length; inner surface of fore tibia with an oblique row of 7 short stout setae running from spur to apex; fore basitarsus with anterior row of 12 short

stout setae, 2nd and 3rd tarsal segments each with 2 such setae at apex; tarsal claws with a small suberect subbasal tooth.

Male.—Unknown.

Types.—*Holotype*: ♀; Sri Lanka, Hambantota District, Palatupana Tank, 10–20 m, 27–29 September 1977, K. V. Krombein and P. B. Karunaratne, USNM Type No. 76076. *Paratype*: 1 ♀, same locality and collectors but 22 June 1978. The paratype has been deposited in the Colombo Museum.

Acknowledgments

C. F. W. Muesebeck, Research Associate, Smithsonian Institution, generously took the time to check my findings and to provide sage counsel.

I am indebted to Joachim Oehlke, Institut für Pflanzenschutzforschung, Eberswalde, D.D.R., for the loan of the holotype of *Mystrocnemis embiidarum* Kieffer.

Michael Day, British Museum (Natural History), London (BM), kindly made available certain specimens studied by O. W. Richards.

E. S. Ross, California Academy of Sciences (CAS), San Francisco, identified several specimens of Embioptera, lent Burmese specimens of *S. citipes*, and furnished much helpful information.

Figures 1–3 are by Susann G. Braden, Scanning Electron Microscope Laboratory, Smithsonian Institution, Washington, D.C. (SI).

Figures 4–5 are by George L. Venable, Department of Entomology (SI).

Field work in Sri Lanka was funded by SFG-0-6955, "Biosystematic Studies of the Insects of Ceylon." Travel was funded by grants from the Secretary's Fluid Research Funds (SI).

Literature Cited

Kieffer, J. J. 1905. Description de Nouveaux Proctotrypides Exotiques. Ann. Soc. Sci. Bruxelles 29:95–142.

———. 1925. Ein neuer, von Prof. Dr. Friedrichs gezüchteter Embiidenparasit. (Bethylid., Hym.). Entomol. Mitt. 14:236–237.

Richards, O. W. 1939. The Bethylidae subfamily Sclerogibbinae (Hymenoptera). Proc. R. Entomol. Soc. London (B) 8:211–223.

———. 1958. Records of Indian Sclerogibbinae (Hymenoptera: Bethylidae). Ann. Mag. Nat. Hist. (13) 1:7–18.